WE CLAIM:

1. A pair of blocks for a reactor for thermal processing of a substrate, comprising:

a first reactor block configured to extend across a top major surface of the substrate, the first reactor block having a first plurality of gas passages configured to face the top major surface, and wherein the first reactor block has a thickness perpendicular to the substrate of greater than about 10 mm;

a second reactor block configured to extend across a bottom major surface of the substrate, the second reactor block having a second plurality of gas passages configured to face the bottom major surface, and wherein the second reactor block has a thickness perpendicular to the substrate of greater than about 10 mm; and

wherein the first and the second reactor blocks are configured to surround a substrate with gas cushions to suspend the substrate between the first and the second reactor blocks upon assembly of the first and the second reactor blocks in the reactor and upon retention of the substrate therebetween.

2. The pair of blocks of Claim 1, wherein a first spacing between the first reactor block and the top major surface of the substrate and a second spacing between the second reactor block and the bottom major surface of the substrate when a substrate occupies a space between the first reactor block and the second reactor block are at most about 1.0 mm upon assembly of the first and the second reactor blocks in the reactor and upon retention of the substrate therebetween.

3. The pair of blocks of Claim 1, wherein at least one of the first or second blocks further comprises a resistive heater, the heater capable of heating the at least one of the first or second blocks to at least about 200°C to thereby heat the substrate.

4. The pair of blocks of Claim 3, wherein the heater is positioned and configured to heat the block to at least about 250°C.

5. The pair of blocks of Claim 4, wherein the heater is positioned and configured to heat the block to at least about 1,000°C.

6. The pair of blocks of Claim 5, wherein the heater is positioned and configured to heat the block to about 1,200°C.

7. The pair of blocks of Claim 3, wherein the heater comprises a heating coil.

8. The pair of blocks of Claim 7, wherein the heater is configured to heat the substrate from a non-reactive temperature to a reactive temperature for treating the substrate.

9. The pair of blocks of Claim 1, wherein the substrate-holding blocks are configured to have sufficient heat capacity so that, when heated, heat is transferred to an unheated substrate loaded between the substrate-holding blocks with negligible temperature loss from the substrate-holding blocks.

10. The pair of blocks of Claim 1, wherein the first and second plurality of gas passages each comprises at least 20 holes.

11. The pair of blocks of Claim 10, wherein the holes each have a diameter of no more than about 2 mm.

12. The pair of blocks of Claim 1, wherein the first plurality of gas passages are distributed across first reactor block to produce a uniform distribution of gas to the top major surface and the second plurality of gas passages are distributed across the second reactor block to produce a second uniform distribution of gas to the bottom major surface upon assembly of the first and the second reactor blocks in the reactor and upon retention of the substrate therebetween.

13. The pair of blocks of Claim 1, wherein the first plurality of gas passages extends closer towards a first perimeter of the first reactor block than the second plurality of gas passages extends to a second perimeter of the second reactor block.

14. The pair of blocks of Claim 1, wherein the first reactor block has a first centering chamfer configured to surround an edge of the substrate and the second reactor block has a second centering chamfer configured to also surround the edge of the substrate.

15. A wafer-holding block for supporting a wafer inside a reactor, comprising:

a wall having a planar surface for facing the wafer, the planar surface at least as wide as a major surface of the wafer;

a plurality of gas passages on the planar surface, the gas passages configured to supply gas to the major surface of the wafer, wherein an opening of each of the gas passages is no more than about 2 mm in width; and

wherein the wafer-holding block is configured to interface with a second wafer-holding block positioned opposite the wafer-holding block such that the wafer-holding block extends across the major surface of the wafer and the second wafer-

holding block extends across an opposite major surface of the wafer upon assembly of the reactor and retention of the wafer.

16. The wafer-holding block of Claim 15, wherein the wall is at least about 10 mm deep.

17. The wafer-holding block of Claim 15, wherein the wall is about 60 mm deep.

18. The wafer-holding block of Claim 15, wherein the wall comprises porous plates, wherein the porous plates provide the gas passages.

19. The wafer-holding block of Claim 15, wherein the gas passages are configured to be connected to a source of gas for deposition on the wafer.

20. The wafer-holding block of Claim 19, wherein the opening of each of the plurality of gas passages is about 0.25 mm in width.

21. The wafer-holding block of Claim 15, wherein the plurality of gas passages comprises at least 20 holes.

22. The wafer-holding block of Claim 21, wherein the plurality of gas passages comprises about 64 holes.

23. The wafer-holding block of Claim 21, wherein at least some of the gas passages are configured to be in gas communication with a source gas for a process selected from the group consisting of oxidation, etching and deposition.

24. The wafer-holding block of Claim 15, wherein the wafer-holding block is provided with a heater.

25. The wafer-holding block of Claim 15, wherein the wafer-holding block is configured to interface with the second wafer-holding block wafer upon assembly of the reactor and retention of the wafer so that a first spacing between the wafer-holding block and a first major surface of the wafer and a second spacing between the second wafer-holding block and a second major surface of the wafer when a wafer occupies a space between the wafer-holding block and the second wafer-holding block are at most about 1.0 mm.

26. The wafer-holding block of Claim 25, configured to be movable relative to the second wafer-holding block.

27. The wafer-holding block of Claim 25, massive enough that, when each of the wafer-holding blocks have been heated to a temperature of approximately 1200°C, an unheated

semiconductor wafer loaded therebetween reaches substantially the same temperature within four seconds of loading.

28. A wafer-supporting block for thermally processing a wafer, comprising:

a plate configured to extend across a major surface of the wafer, the plate having a thickness perpendicular to the wafer of greater than about 10 mm;

a plurality of distributed gas passages in the plate and configured to face the wafer and capable of creating a supporting gas cushion between the plate and the wafer during thermal processing; and

a resistive heater capable of heating the plate to at least about 200°C to thereby heat the wafer,

wherein a heat capacity of the wafer-supporting block is sufficiently high so that when the wafer-supporting block is heated, heat is transferred to an unheated wafer loaded proximate the wafer-holding block with negligible temperature loss from the wafer-supporting block.

29. The wafer-supporting block of Claim 28, further comprising a raised centering edge on the plate configured to surround an edge of the wafer.